INFLUENCE OF REAL-TIME KINEMATIC NETWORK IN CADASTRAL SURVEYING

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DEDICATION

To my beloved my wife, Marlina Binti Abdul Manaf,

Thank you for your constant support throughout my 2 years here at UTM

my son, Ahmad Firdaus B. Mohd Zahirudin and Ahmad Solehin B. Mohd Zahirudin

and to my family,

I Love you All

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ABSTRACT

Development of cadastral surveying in Malaysia has showing excellent progress with the application of the latest surveying technology where in the year of 2003 JUPEM has implemented Real-Time Kinematic GNSS Network (MyRTKnet). Currently there are seventy eight (78) GNSS reference stations over the entire country compared with twenty nine (29) a network of Continuously Operating Reference Stations (CORS) in 2003. This study focuses on analyzing the performance of GPS observation using Network based-RTK technique and Virtual Reference Station-RTK technique in conducting cadastral reference mark within a 30 km radius from the existing MyRTKnet Station and also outside a 30 km radius from the existing Reference Station. The test observation carried out on eight Cadastral Reference Mark located at North, Perak. The accuracy of the VRS-RTK in the horizontal component is in the range of 1cm to 2cm. While for the accuracy of N-RTK in horizontal component is in the range 1cm to 2.5cm. Based on the JUPEM circular no. 6/2009 the results acquired are within the tolerance where the coordinate difference between three epochs of observation were less than 3 centimeter for Northing and Easting component.

ABSTRAK

Perkembangan dalam bidang Ukur Kadaster di Malaysia telah menunjukkan kemajuan yang cemerlang dengan mengaplikasikan teknologi pengukuran yang terkini dimana pada tahun 2003 JUPEM telah melaksanakan Rangkaian Kinematik Masa Hakiki yang dikenali sebagai *MyRTKnet*. Pada masa ini terdapat tujuh puluh stesen lapan (78) rujukan GNSS seluruh negara berbanding dengan dua puluh sembilan (29) rangkaian Stesen Rujukan Beroperasi Berterusan (CORS) pada tahun 2003. Kajian ini memberi tumpuan kepada analisis kualiti cerapan GPS menggunakan Teknik *Network based-RTK* dan Teknik *Virtual Reference Station-RTK* dalam lingkungan 30 km daripada Stesen MyRTKnet yang sedia ada dan juga di luar lingkungan 30 km dari Stesen Rujukan yang sedia ada. Kajian ini dilakukan ke atas lapan (8) *Cadastral Reference Mark* di bahagian Utara negeri Perak. Ketepatan bagi teknik *VRS-RTK* pada paksi ufuk adalah 1cm hingga 2 cm manakala ketepatan bagi *N-RTK* pada paksi ufuk adalah 1cm hingga 2.5cm. Hasil kajian ini masih memenuhi had yang dibenarkan, dimana perbezaan tiga epok cerapan adalah kurang daripada 3 cm bagi komponen Utara dan komponen Timur mengikut pekeliling JUPEM bil 6/2009.